SCIENCE NEWS-LETTER

The Weekly Summary of Current Science

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TRY THIS ON YOUR AIRPLANE

Plane in Crash Test Catches Fire from Muffler.

(See page 27)

Vol. XV No. 406

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Anthropology

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However, even when aviation engineering has advanced to the point where all planes are equipped with quiet motors, the problem is only half solved. At least half of the noise of an airplane comes from the propeller, and there are other minor sources, such as the wind and slipstream from the propeller striking the struts and other exposed surfaces, the rumble and click of gears and valves, and vibration of wires and other parts attached to the fuselage.

Recently there have been two developments that offer the first possibilities of a practical solution of the noise problem. A device which will cut down the exhaust noises without adding appreciably to the weight, fire hazard, or causing a loss of power, has been developed on an entirely new principle than has previously been used.

The exhaust gases are gathered together in two pipes and passed into the inside of the blades of a hollow steel propeller that has just been invented. By leaving an opening on the trailing edges of the blades from which the gases escape, the centrifugal effect causes a partial vacuum to be built up inside the propeller. Discharging the exhaust into this vacuum, it is believed, will practically eliminate the sound of the motor explosions which form the main source of annoyance both to passengers and persons on the ground. The Navy Department, which is particularly interested in the problem from the military angle, is placing great reliance on this device, and Navy engineers in charge of the work of building a silent plane say that it is the first device that has been presented in 20 years that seems to offer a practical solution to the question of silencing the motor without lessening the efficiency of the airplane.

Tests on the first of these hollow steel blades to be delivered have been so satisfactory that the department plans to order a large number of the propellers, regardless of the outcome of the experiments on the muffling device, as the steel blades will cost less than present aluminum alloy blades. The hot gases will warm the propeller so that there will be no possibility of ice forming on the blades, and no back pressure, which reduces the power of the motor, is built up, as has been the case with all previous devices of this character. This is the first time in 15 years of constant experimentation that a satisfactory hollow propeller has been found. It is made from a light chrome vanadium steel with the elements welded together by a new electrical process, making the joints as strong as the surface. This makes possible the application of the muffling device which is expected to have a marked effect on the future development of aviation.

Not only will the motor be silenced by this device, but it will do away with the long hot exhaust pipe which is the main cause of fire in planes, turning slight accidents in landing and in the air into horrible tragedies. Various manufacturers have cut down the noise to passengers by carrying the end of the exhaust pipe over or under the wings, thus making the wing act as a sound insulator. But the added length of hot pipe furnishes a great fire risk if a few drops of oil or gasoline are spilled in a crash or in refueling.

Several patent applications are now pending on this vacuum method of dealing with the exhaust, and a half-dozen of the leading aviation manufacturers are prepared to spend thousands of dollars to obtain exclusive rights to the invention. It is believed that the fight for the control of this patent will be one of the hardest fought legal battles in the history of aviation.

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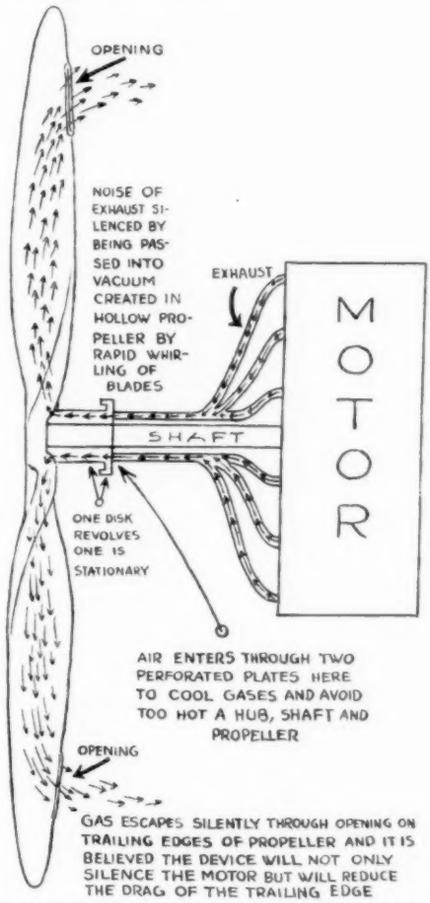

DIAGRAM OF THE HOLLOW PROPELLER, showing how it is proposed to let the engine exhaust escape through the propeller blade, thus reducing the noise of the exhaust and of the propeller itself

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Noiseless Airplanes Aviation's Goal—*Continued*

created by the blade tips cutting the air at 6 to 11 miles per minute.

The blades now in general use are made of light aluminum alloy, and they vibrate very much as the tuning fork familiar to every high school student taking physics, thus creating a series of notes much the same as striking several keys at random on a piano.

This noise can be understood by whirling a stick rapidly through the air. A high-pitched and very loud sound is created and when this is multiplied thousands of times the noise made by the airplane propellers is approximated. If the blades can be shortened and the number of revolutions per minute reduced the noise will be lessened, but this so reduces the performance of the plane as to make it impracticable at the present time unless gears and large slowly revolving propellers are used. And this is not always practicable. Some pusher planes are now in use with the motors and propellers behind the cockpit and cabins. This makes the noise less audible to passengers and pilots, but so unbalances the plane that landing is extremely dangerous. Advancement of engineering design may bring this type of plane into more general use. However, all research work along this line indicates that unless the whole principle of plane propulsion is radically changed a certain amount of noise from the propeller will always be present.

The first country to develop a noiseless propeller or other system of propelling the plane will have a tremendous military advantage over the world. The value of airplanes in war depends to a large extent on the element of surprise. At present the noise, which can be heard by sound-detecting devices for miles, gives a warning to the opposing forces allowing them to range anti-aircraft guns, send up opposing planes, and prepare other protective devices that are being developed. If a silent airplane can be invented, entire cities and armies may be wiped out by poison gas, disease germs, and bombs before the ground forces are aware of their presence. A fortune awaits the inventor of such a device for commercial use and military supremacy in the air will go to the country which first develops it secretly.

Engineers granting that this problem is almost impossible of solution, William P. MacCracken, Jr., Assistant Secretary of Commerce in charge

EXPERIMENTAL NOISELESS CABIN for airplanes, made at the Bureau of Standards, with walls of a new material that deadens sound but adds little weight

of Aviation, attacked the problem from the angle of building a sound-proof airplane cabin. Funds for the first comprehensive experiments along this line were made available to engineers of the U. S. Bureau of Standards, and they have recently completed the most advanced cabin of this design yet made.

"The success of experiments with this cabin indicate that in the near future all cabin planes will be so constructed that the noise audible to passengers will be reduced from a deafening roar, which makes conversation impossible, to the comparative quiet of a Pullman car," Mr. MacCracken said.

This problem is also difficult because it is not practical to add much weight for sound insulation. The known types of sound proof walls must be rejected for this reason, but engineers of the bureau finally found a new material which deadens the sound without adding much weight. The ideal cabin must do two things, it must deflect as much of the sound from motors, propellers, and vibration as possible, and the inside must be constructed to absorb what sound does enter. The outside of this experimental cabin is compose l of duralumin, a light thin metal composed principally of aluminum, and the inside is covered with a material new to airplane construction, made from the fiber obtained from the pods of certain tropical trees. This substance has been in general use for lining refrigerators, and it is believed will aid greatly in keeping the cabin warm. Each fiber is in effect a sealed air tube, making it very light in weight. The fibers are incapable of absorbing moisture from the air and this is important as disaster might be caused by the adding of unexpected weight to the plane. Sound entering or originating in the cabin is absorbed by the material, which was found to be more efficient than balsa wood, cotton batting, and hair felt which has been used for this purpose by some manufacturers. This type of construction is as satisfactory as any known material five times its weight.

While this construction deadens the sound in cabin planes, it of course has little value when applied to the open cockpit type. The value of the outside duralumin reflecting material is also greatly reduced when the windows are open in warm weather. However, it is quite possible that a new ventilating system may be developed which will allow the air to enter and keep out the sound.

Engineers believe that the development of airplane bodies will follow closely the history of automobiles. In the first stages of their general use, open bodies formed over 95 per cent. of the total sales. Gradually the sedan body became more popular as production costs decreased, until today the great majority of all cars sold are enclosed. The comfort coming from sound insulation possible to passengers only in cabin planes will probably cause the cabin plane to come into general use within the very near future.

Elimination of other noises such as the vibration of wires, struts, cabin walls, and other engine noises, is merely a question of refinement of design. Great strides have been made in this direction in the last five years, and the final elimination of these minor sounds has almost been accomplished in the more expensive planes.

The whistle of the wind, and slipstream of the propeller against all exposed parts is a more difficult problem. A low velocity wind of 20 to 30 miles an hour creates a very audible sound in blowing through trees, and when this is compared to a wind of from 100 to 125 miles an hour which is the ordinary velocity of wind against the plane, not taking into account the slipstream from the propeller, it is easy to see that (*Turn to page* 31

How to Prevent and Treat Influenza

Medicine

When public health officers and scientists, attempting to solve the mystery of influenza, gathered in war conference at the call of the U. S. Public Health Service, they formulated advice to individuals for protection against and treatment of influenza.

For Protection

Make more than the ordinary effort to increase your well-being when influenza, colds and upper respiratory infections are prevalent, the conference recommended.

Nine "do and don'ts" useful in guarding against the disease were formulated as follows:

1. Secure adequate sleep and rest (eight to ten hours' sleep every night with windows open, but under enough covering to keep warm).

2. Eat a moderate, mixed diet and partake freely, at regular periods, of pure water (six to eight glasses daily).

3. Wear clothing to suit the environment, particularly clothing which prevents chilling of the body surfaces and which keeps the body dry.

4. Avoid people with colds, especially those who are sneezing or coughing. There is more danger from contact with those just beginning to feel sick than from those ill enough to be confined to bed.

5. Keep out of crowds as far as possible, especially crowds in closed places.

6. Avoid the use of common towels, wash basins, glasses, eating utensils and toilet articles.

7. Wash the hands thoroughly before eating.

8. Avoid the use of any so-called preventives. Vaccines, sera and advertised preventatives seem to be of no value and may be harmful in this disease.

9. Avoid alcohol and stimulants of all sorts.

For Treatment

If you get the disease, follow these four recommendations of the influenza conference to prevent becoming seriously ill:

1. If you have a cold, feel badly, or are feverish, go to bed at once, cover up warmly and have the windows open; send for a physician and follow his instructions.

2. Do not take any so-called cures. There is no specific cure for this disease.

3. If you cannot get a doctor, remain in bed, eat a simple diet, take plenty of fluids, such as water, fruit juices, milk, bouillon, hot soups, at frequent intervals. Use a mild cathartic if constipated.

4. Remember that the most important measure of preventing pneumonia or other serious complications is to remain in bed until all symptoms have disappeared and then, under the physician's advice, to return very gradually to your physical activities, being sure to rest before you get tired.

The present epidemic is influenza. This is the verdict of the influenza conference called by the U. S. Public Health Service.

Early in November it began in the vicinity of San Francisco. It extended, with characteristic rapidity and in regular sequence, from the Pacific to the Atlantic.

"The epidemic is already on the decline in those western cities which were first affected; and has apparently reached its peak in some middle western cities, but in the east seems not yet to have reached its full development," said a committee report to the conference. "The effect on mortality has not approximated that caused by the pandemic of 1918, and has been less than the epidemic of 1920, but more severe than at any time since the latter date."

Stigmata of the "Flu"

The features which have distinguished influenza in its typical pandemic outbreaks, such as those in 1918 and 1889-90, as listed by the conference, are:

1. A great increase in the prevalence of illness of which the usual symptoms are: fever, of more or less sudden onset, of moderately high range and of only a few days' duration; aching of the body and limbs; inflammation of the upper respiratory passages, and marked prostration. In its manner of spread this disease has the characteristics of a highly contagious infection, transmitted directly from person to person.

2. Coincident increase in the prevalence of pneumonia, developing apparently as a complication of a certain proportion of the influenza cases.

3. A rise in the general mortality rate, due largely to increase in deaths certified as influenza or pneumonia. These deaths characteristically show an age-distribution different from that of normal times, in that the proportion of young adults is increased.

4. In any given locality, the epidemic develops and runs its course rapidly, so that its duration, even in a large city, is a matter of not more than five or ten weeks.

5. The tendency is to rapid and wide extension, different communities being attacked in such quick succession that the spread across a continent requires only a few weeks, and where the disease becomes pandemic it travels around the world within three to six months.

The epidemics which show the full development of all these features, including world-wide prevalence, are rather rare events, recurring at intervals which usually have exceeded 20 years. However, at much more frequent intervals we have minor epidemics, similar in general character, but differing from the typical picture in some respects, notably in lower prevalence, less severe clinical type, slighter effect on mortality and less extensive area of spread. The exact relationship which these bear to true pandemic influenza is still a matter of investigation rather than fixed opinion; but the more distinct of the minor epidemics are generally accepted as true influenza of modified virulence and intensity. Since 1919 at least two such outbreaks have occurred in the United States; one in 1920 and one in 1926, with some more doubtful epidemics in other years.

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Health Institute Proposed

Hygiene

A national institute of health, to be under the administration of the Surgeon General of the United States, would be established in the District of Columbia, at an approximate cost of $1,000,000, under the terms of a bill just introduced in the House by Representative John J. Kindred, Democrat, of New York.

Kindred's bill would authorize the Secretary of the Treasury to select a site and purchase it and to arrange for the erection of suitable buildings in which study, investigation, and research work in human diseases could be suitably carried out.

Arrangements would be made whereby fellowships could be established, and any individual scientists given such fellowships would be appointed for duty in the Institute and would be accorded the facilities of the Hygienic Laboratory.

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The Body's Ellis Island

Parasitology

PROF. CHARLES A. KOFOID, of the University of California, in an address before the American Association for the Advancement of Science:

The vertebrate mouth from the standpoint of the parasitologist is one of the main portals of entry for parasitic infections of the digestive tract and its morphological annexes. In the case of civilized man, whose body is so generally protected elsewhere by clothing, shoes, hat and gloves, its relative importance becomes even greater, especially when we add the additional factor of the mobile hand and opposable thumb, the use of implements and the infantile tendency to put anything the hand grasps into the mouth.

The mouth of man is one of the greatest areas for contact with the environment. Through the posterior nares the inhaled air and the dust and germs collected from it on the surfaces of the nasal cavities have an indirect access to the buccal cavity. The food daily passed through the mouth, though weighing only several pounds, has passed through the hands of who knows how many hundreds of persons, sweating coolies rolling tea leaves in Chinese godowns, laborers in Arabia, Sao Paulo or Limon washing out coffee beans, Malays in Batavia roasting chocolate beans, negroes in Havana or Filipinos in Honolulu handling sugar, Mexicans picking oranges in Riverside, and so on through the long list of essentials and relishes that supply and embellish our daily menu. How far we should have to travel if we should attempt to subvert the rest of our bodies to the geographical range of environment which has been in contact with the foods and drinks which we daily introduce into our mouths. Truly, how provincial is the rest of our corporal substance in comparison with the travelled versatility of our oral cavity! How varied, too, are the substances which come in daily contact here with delicate mucous membrane. They range in temperature from below freezing to nearly boiling point and include both acids and bases, essential oils, fats and alkalis, sugars, salts and proteins of the widest range. Even under the most rigorous treatment of any mode of physiotherapy no other part of our body could receive daily so varied applications of the stimulating materials from the external world.

The mouth is also a region of no little mechanical shock and impact. Powerful muscles bring the teeth in contact with food which is ground up and mixed with the saliva. The teeth upon which this impact is first received transmit the pressure to the delicate tissues which invest their imbedded surfaces, and thence to the bony alveolar sockets in which they rest. No other part of the body receives such an impact upon so restricted a surface, except possibly the soles of the feet of the hobo or the athlete.

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". . And On Our Children"

Evolution

REV. BEN M. BOGARD, of Little Rock, as quoted in the *Arkansas Gazette*, December 10, 1928:

If the worst comes to the worst, we had better let our children suffer from disease and even die from neglect than to instill into their impressionable hearts the idea that the Bible is false and that it especially lies when it says God created man in his own image.

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Ur Yields Old Gods and Royal Tombs

Archaeology

The body of a baby girl, adorned with a little gold headdress almost exactly like that worn by Queen Shub-ad of Ur, is one of the new discoveries in the royal graves at Ur of the Chaldees, according to a report just received from C. Leonard Woolley, director of the joint expedition of the University of Pennsylvania Museum and the British Museum.

This 5,000-year-old grave, which Mr. Woolley suggests might be called the grave of the baby princess, contained also a set of miniature silver dishes, including a tumbler and bowls. The royal headdress, which attracted much attention last season when discovered with the remains of the Queen, is a delicate and elaborate structure of gold ribbon, gold leaves, and flowers with pointed petals.

After two months' excavation at the ancient cemetery this season, remarkable finds have already been made, and the investigations have just reached the deep-buried layer of earth where, according to last year's experience, the most important tombs should lie.

The director reports that he is now working at a sector of the cemetery hitherto untouched by archæologists, and although more than 200 graves have already been found there, only a few places have been probed to the depth at which royal tombs may be expected.

COPPER STATUE, representing a human face, possibly the face of a god, with animal horns, found in the latest excavations at Ur

From discoveries that have been made, the expedition staff has formed the theory that a king's burial in Ur would be in a subterranean building at the bottom of a deep vertical shaft. After the king was buried there and his slaughtered attendants were laid with him, the shaft would be filled in at intervals with votive offerings up to a certain point. There a chamber would be constructed to receive the last offerings and over this more earth, and finally, possibly as a superstructure, there would be a funerary chapel.

The tomb of a woman, wearing a golden headdress and other jewelry, has been discovered, the circumstances indicating elaborate burial rites. Four men-servants or soldiers and a serving maid were buried with this lady of Ur. Outside the stone blocking of the door were set clay pots of food and the carcass of a sheep. In the filling-in of the shaft leading down to the tomb, the excavators found tier above tier of food vessels and meat offerings and human skeletons.

"Another most interesting discovery was that of a harp," Mr. Woolley wrote. "The woodwork of the instrument had decayed and disappeared, but luckily a workman noticed the holes which it had left in the soil, and by filling these with plaster of paris we obtained a complete cast of the harp's body, to which was attached the bull's head of copper inlaid with lapis lazuli. The most astonishing thing was the fact that when the earth was carefully cut away to expose the cast there were found surviving as lines of white fibrous powder the ten cat-gut strings of the harp.

"Prominent among our other finds are a copper statue-head, possibly of a god, having a human face and the horns and ears of a bull, and a painted clay pot, which is the first complete one of its kind found at Ur."

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Noiseless Airplanes—*Cont.*

a constant whistle will be present. This is being reduced by cutting down the number of exposed wires, supports and other equipment attached to the fuselage.

When early slumbers are broken or the peace of an evening shattered, even aviation enthusiasts have visions of a terrible future when the whole heavens will pulsate to the whirling roar of many motored planes.

Nevertheless, the time is almost at hand when airplane engines will be as quiet as automobile power plants, and airplane passengers can expect to ride in enclosed cabins as quiet and comfortable as railroad cars within a year or two. For the man on the ground, aviation engineering does not promise the complete elimination but only the reduction of the present noise. (*Turn to next page*)

"Our Father"—65 Per Cent

Education

Tennessee college students preparing to be teachers are well acquainted with the words of the Lord's Prayer, but they understand only about two-thirds of this famous classic which they will repeat daily in their schoolrooms. This is shown by an educational experiment with 540 students, conducted by Lester R. Wheeler, of the East Tennessee State Teachers College, and reported to *School and Society*.

Ninety-six per cent. of the future school teachers wrote the words of the Lord's Prayer from memory without leaving out a word. When asked to explain the fifteen different thought units, the average student gave acceptable interpretations of only 65 per cent. of the ideas. Some of the units were found to be much easier to understand than (*Turn to next page*)

Good as Neon Lights

Physics

Red neon lights, suggested as beacons for airports, are not any better able to penetrate fog, as its advocates have claimed, than ordinary incandescent lamps, equipped with colored screens. This was announced by Dr. Lyman J. Briggs, of the U. S. Bureau of Standards. Neon lights are familiar to everyone because they are used in the newest tubular advertising signs.

Tests carried out by Bureau of Standards scientists were made under actual field conditions. The neon lamp was compared with incandescent lamps so arranged that the color, size and shape of each lamp appeared identical to the aviator.

"The test showed that there is no real difference in the fog-penetrating quality of the light from the two sources," said Dr. (*Turn to next page*)

Misapplied Chemistry

Chemistry

ARTHUR D. LITTLE, in *The Handwriting on the Wall* (Little, Brown):

It would be a pleasure to rehearse the triumphs of applied chemistry and to demonstrate its intimate relation to agriculture and to industry of every sort. I should like to make you realize how deeply you are indebted to Faraday and Pasteur, to Burton, Nobel, and Solvay, and to those many other men of genius who, in cooperation with the rank and file of laboratory workers, have conferred upon you countless benefits. For the moment, however, I have assumed the functions of the Devil's Advocate and in that capacity must direct your attention to chemistry when misapplied.

Misapplied chemistry is the chemistry of the ignorant, the charlatan, and the swindler. It flourished long before the practices of Egyptian priests led the Arabs to adopt for it the name Al Chemy, the Egyptian, or Black Art, and it remains to-day an active and sinister offshoot of the science.

There are, of course, instances without number where chemistry has been misapplied without intention, and these we may view with charity. We may even be grateful to that chemical student who reported that hydrofluoric acid "itches" glass, though it is obviously a pity that glass should itch when it is so hard to scratch. We may sympathize with that other student who defined caustic soda as "a cooling summer drink," and we need not condemn too harshly the druggist who gave the very little girl aspirin when what she asked for was ice cream. The little girl probably said quite enough herself. We need not be so tolerant with the manufacturer who misbrands his goods or who sells water at high prices. Some years ago we analyzed a leather stain for which a Jewish client was paying eighty-five cents a gallon. It proved to be water containing a little gum tragacanth colored with aniline dye. When our client read the certificate he remarked, "Now I see where the Gentiles get the money that we get from the Gentiles."

The late Professor Brush, the distinguished mineralogist of Yale, delighted in the story of the young farmer, who knocked timidly at his office door one day. In response to the professor's invitation to enter, the farmer's head appeared at the partly opened door, and an anxious voice inquired, "Are you alone?" "Yes, yes," said the professor, "come in." The farmer entered, closed the door carefully behind him, seated himself, and from the depths of a carpetbag drew forth a large lump of yellow mineral, which he passed to the professor. "What do you think of that?" he said. Professor Brush examined it for a moment and replied, "I never saw a finer specimen of pyrite." "Pyrite!" said the young man, "What do you mean? Ain't that gold?" "No," said Professor Brush. "It is only a compound of iron and sulphur." The farmer sank into his chair, then pulled himself together, and said weekly, "My God! Professor, I've just married twenty acres of it."

Our own experience with the prize hens concerned a local example of misapplied chemistry. The award of the blue ribbon to a fine coop of Rhode Island reds had been contested by a defeated exhibitor on the ground that the hens were dyed. We were waited upon by a committee, who requested that we determine whether the hens were in fact better than they should be, since it appeared that hens are not permitted the cosmetic aids so freely utilized in other feminine circles. Never having analyzed a hen, we stipulated that the committeee should supply one which, like Cæsar's wife, was above suspicion. This they did, and from her feathers we were unable to extract a trace of dye. From those of the beribboned birds, however, sufficient color was readily removed to dye deeply large skeins of worsted.

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Palestine's Jewish population is growing rapidly.

Good as Neon—*Cont'd*

Briggs. "In beacons of moderate candlepower any advantages due to the distinctive color of a neon lamp may be obtained more conveniently and simply and more reliably by means of an incandescent filament lamp equipped with a suitable color screen."

As a matter of fact, putting a red filter in front of a light does not increase its fog-penetrating power, he said. Tests were also made with incandescent lamps, one of which was covered with a red screen. The lamps were both of the same power. In every case it was found that the uncovered light could be seen through a greater thickness of fog.

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"Our Father"—*Cont'd*

others. Only 44 per cent. could explain "Our Father," while Thy kingdom come" proved to be the most difficult of all, and was answered by only 43 per cent. The easiest passages were "and forgive us our debts" and "lead us not into temptation."

The investigation indicates "that the school and church are failing in teaching the student the wider and more subtle meaning of this well-known passage," Mr. Wheeler reports. "If college students understand only about two-thirds of the prayer the ignorance of the average child will probably be more appalling than this study indicates."

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Noiseless Airplanes—*Cont.*

With the more vital problems of aviation well on the road to solution, it is quite possible that inventive genius will solve the problem of propeller noise, or possibly change the whole principle of airplane propulsion. It is not beyond the realm of imagination that the present generation may live to see the day when airplanes will slip noiselessly through the air on missions of pleasure and commerce, or in time of war on trips of deadly destruction.

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Virginia has produced more scientists than any other state in the South.

Tipsy Mimosas, Tamed Crabapples

Biology

Following are further reports on papers in the biological sciences read at the New York meeting of the American Association for the Advancement of Science.

A plant that gets tipsy on fumes of common grain alcohol but which has so remarkable a "head" that wood alcohol fumes have practically no effect on it, was introduced to botanical visitors to the American Association meeting by Dr. Raymond H. Wallace of Columbia University. It is our old friend the sensitive plant, which suddenly folds up its leaves and hangs them down beside its stem when it is touched or shaken. Dr. Wallace has been subjecting large numbers of sensitive plants to various kinds of gases and fumes commonly used as anesthetics on human beings and animals. In the course of his researches he tried grain alcohol fumes. Instead of making the plant duller and less responsive to a touch, as ether does, the alcohol pepped it up and made it livelier than ever. And grain alcohol was the only alcohol that would cause this response. Toward wood alcohol the sensitive plant was not at all sensitive. Moreover, ether was the only animal anesthetic that had any effect on the plant. This gas made it "dopy," so that it could be struck or shaken violently without folding its leaves; or, if it were etherized when "asleep," it would not unfold them again. Chloroform and other anesthetics had no effect on it.

Another queer effect of all the alcohols, including grain, wood, and several of the so-called higher alcohols, was to make the leaves "flop" suddenly without being touched. After a certain period of collapse they would slowly lift themselves again, and once more, without apparent reason, go "flop." Dr. Walllace said that plants have repeated this drunken performance as often as three times during a long exposure to alcohol fumes.

Taming the Wild Crabapple

The taming of the shrewish wild American crabapple, which in the native state has fruits so puckery that none but the hardy palates of small boys can tolerate them, into a whole series of desirable apples for table, cooking and ornamental shrub use, is the horticultural feat which has been accomplished by Dr. N. E. Hansen of South Dakota State College. He made a marriage for this pomological hard-boiled virgin with the more civilized European cultivated apple; but before this was possible he had to untangle the too-complicated European pedigree until it was as simple as that of the native apple—"reducing it to a homozygous condition," in the language of the geneticists.

The offspring of this union have turned out well in several instances. One of the new varieties is an all-red apple. It has red flowers, followed by fruit that is red-skinned and red-fleshed to the core. It makes very good jelly and preserves, Dr. Hansen reported, and scored a great hit when exhibited for the first time last fall. All of the hybrids are very early bearing trees, producing their first crops when only two years old, and bearing fruit on wood of the previous year's growth instead of on two-year-old twigs. The trees can be grown to any desired height—some of the varieties are more like large bushes than trees—which makes for more economical spraying.

The whole foundation of Dr. Hansen's plant-breeding creed is the necessity for getting back to strains of simple "homozygous" pedigree before starting any new crosses. Most of our domestic fruit stocks have been cultivated so long and hybridized so often that their family trees are all mixed up, and no one can predict what a given crossing will produce. This simplification of plant pedigree before beginning to breed has been done on corn with great success, he points out, and the success there obtained can be duplicated with other plants.

Beetle Meets Match in Geranium

"They sells you fixed bay'nits which rots out your guts." So Kipling, in one of his hard-boiled soldier poems, warns the young recruit against the lure of the lighted windows of the dram-seller's huts. The Japanese beetle, dreaded scourge of gardeners in the eastern states, finds a similar lure and a like destruction in the common geranium, favorite houseplant of gentle old ladies.

This paradox of entomology was discovered by Charles H. Ballou of the U. S. Department of Agriculture. This alien insect, whose jaws can chew up anything that grows out of the ground and whose digestive tract has hitherto proved equal to the task of converting any kind of vegetable, fruit or weed into more beetle, meets its Waterloo when it eats the leaves or flowers of ordinary geraniums. And it has a perverse fondness for geraniums, too, for it is known to fly for several hundred yards to find baits which have been scented with geraniol, the basis of geranium odor.

After a meal of geranium leaves or petals, the beetles become paralyzed. The paralysis begins with the hind legs and progresses forward. About 35 per cent. of all paralyzed insects die within 24 hours. Those that recover do so within four days. A dissection of killed bettles shows that the geranium poison destroys a part of the digestive tract within 24 hours, and all soft contents of the body cavity are disintegrated within 48 hours.

Mr. Ballou stated that the flowers appear to be both more attractive and more poisonous to the beetles than the leaves, and that this effect is heightened when the feeding takes place on plants exposed to sunlight.

Trout Efficient Food Makers

"Measurements of the food requirements in calories to produce a given increase in body weight show that the trout is as efficient a converter of energy as the best of the higher vertebrates."

In this compact declaration, three students of the ways of the favorite of fishermen set up the claim of the trout to consideration as an economic converter of raw material into good meat, on a par with cattle, sheep and pigs. The men are C. M. McCay, W. E. Dilley and M. F. Crowell, of Cornell University and the Connecticut State Hatchery.

They have been feeding things to trout that no trout ever ate in nature, and the trout have been thriving on them. Dried skim milk, which is not exactly the most marketable stuff in the world, goes very well with the young fish, if supplemented with a little raw liver. They will live on the milk alone for several months, but finally die, apparently for lack of a vitamin which is supplied in the liver. But on the mixed milk-and-liver diet they thrive better than they do on liver alone. Trout are able to make use of grain as food also, the experimenters stated.

A double-walled flower-pot automatically irrigating the plant growing in the inner pot with (*Turn to next page*)

Biology at A. A. A. S. Meeting—*Continued*

water contained in the space between the two walls, was the device described by Dr. J. Dean Wilson of the Ohio Agricultural Experiment Station, Wooster, Ohio. The inner pot is made of porus material, somewhat like the conventional flower-pot of commerce. The outer one is waterproof, and the two are united at the top by means of a flanged rim. An extended series of tests has demonstrated the practicability of his device, Dr. Wilson stated.

Bees' Breath Measured

The breath of a bee may seem a queer thing for serious scientific investigation, but it has practical significance at two seasons of the year. In winter it may be an index to the health of the sleeping hive, and in summer, when flower nectar is being condensed into honey, it may be worth knowing as a check on this living sweet-factory. For these reasons, as well as just for the satisfaction of finding out something new, Prof. G. H. Vansell of the University of California has been looking into the subject.

Prof. Vansell has not yet attempted to analyze the respiratory activities of a single bee, but he has for many months kept track of the carbon dioxide and water vapor given off in the communal breath of an entire hive, under both winter and summer conditions. He led the air coming from the hive through a tube into bulbs filled with absorbent chemicals. By weighing these, after allowing for the natural carbon dioxide and water content of the outside air, he has been able to get an hourly analysis of the breath of the hive.

In winter, when the colony was reduced in numbers and the bees quiescent, the average hourly water loss from the hive was 36 millionths of an ounce. In summer, when the colony was larger, and the workers were actively at work condensing nectar into honey, the quantity of water given off was nearly 25 times as great. The carbon dioxide outgo from the hive did not show nearly so great a difference. The average hourly rate in winter was 620 millionths of an ounce, and this rate was not even doubled when summer came.

One anomaly was noted by Prof. Vansell. At times the wintering cluster of bees gave off respiratory air that contained less water than the outside atmosphere. This would appear to indicate that either the bees or their stores of food were at such times absorbing water from the air.

A 22-Generation Memory

That "the Elephant never forgets" is a favorite tradition of the circus lot and the zoo. But the big pachyderm's record has been badly scotched by a lowly animal that lives in the water, whose great-grandchildren of the twenty-second generation remember a complex instinct possessed by their ancestor but which their more immediate forebears have never had an opportunity of exercising.

Before the meeting of the American Society of Zoologists Prof. W. A. Kepner presented the results of experiments which he and J. W. Nuttycombe, now of the University of Tennessee, performed on a tiny, almost microscopic, animal known as *Microstomum*. This creature is one of the many in the lower realms of nature that is armed with stinging cells in its body wall, partly for protection against its enemies and partly to assist in the capture of its prey. In the fierce economy of the lesser world of the waters, this animal feeds on a similar but smaller form, the hydra, which is also armed with stinging cells. It apparently does not like hydra very much, for it will not eat it except when its supply of stinging-cells is low. Then it swallows hydra readily enough, and appropriates the ready-made cells.

The two experimenters grew a strain of *Microstomum* for 22 generations, without ever giving them an opportunity to meet and feed on hydras. Yet at the end of that time the animals went through the same performance their ancestors had been used to: swallowed the hydra, turned over the stinging cells to certain wandering cells of their own bodies, and eventually set them in order among their own stinging cells. In another case, a sixteenth-generation *Microstomum* had its upper and lower ends cut off. The middle third of the body regenerated new ends, and the "revised" animal went through the long-disused performance as though it had been used to it all its life.

Whoever likes pineapple can blame an almost invisible little worm for part of the scarcity of his favorite tropical fruit. A nematode worm, belonging to the same general group that raised so much trouble with imported flower bulbs in this country a few years ago, gets into the roots of the pineapple plants and chokes them, according to Dr. G. H. Godfrey, Hawaiian researcher. The nematodes multiply and migrate just under the skin of the root until it is entirely killed and the feeding surface of the plant thereby greatly reduced. The problem of dealing with the pest is made more difficult by the fact that the same worm feeds on tomatoes, soybeans, cowpeas and many weeds, so that even if the pineapple fields in a given region were cleared the worms would not die of starvation but would merely live over until the next pineapple crop appeared.

Benzoate Depends On Acidity

Benzoate of soda, widely used as a food preservative and often the subject of bitter controversy, depends for its effectiveness on the acidity or alkalinity of the foodstuff to which it is added to prevent spoilage. Prof. W. V. Cruess of the Univversity of California reported a series of experiments he made, showing that the conventional one-tenth of one per cent. is not always sufficient, and that sometimes it is more than enough.

In media that were somewhat acid, represented on the chemist's scale as "pH 2 to 3.5," less than six hundredths of one per cent. of sodium benzoate sufficed to prevent the growth of moulds, yeasts, and acid-tolerant bacteria. Around the neutral point, however, as well as over into the slightly alkaline side of the balance, concentrations in excess of one and one-half per cent. were necessary to inhibit growth.

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CLASSICS OF SCIENCE: Florence Nightingale on Nursing

Nursing

At this time, when epidemic influenza is again visiting the United States, Florence Nightingale's classic works are peculiarly appropriate. The medical knowledge of her day has been largely superseded—she was two years older than Pasteur, and had founded war nursing at the time that he was just beginning his researches—but her exquisite power of observation and her amazing common sense are as valuable today as when, 70 years ago, she wrote:

"If, then, every woman must at some time or other of her life, become a nurse, *i. e.*, have charge of somebody's health, how immense and how valuable would be the produce of her united experience if every woman would think how to nurse. I do not pretend to teach her how. I ask her to teach herself, and for this purpose I venture to give her some hints."

NOTES ON NURSING; What it is, and what it is not. By Florence Nightingale. London, 1858; *New York,* 1860.

Petty Management

All the results of good nursing as detailed in these notes, may be spoiled or utterly negatived by one defect, viz.: in petty management, or in other words, by not knowing how to manage that what you do when you are there, shall be done when you are not there. The most devoted friend or nurse cannot be always *there*. Nor is it desirable that she should. And she may give up her health, all her duties, and yet, for want of a little management, be not one-half so efficient as another who is not one-half so devoted, but who has this art of multiplying herself—that is to say, the patient of the first will not really be so well cared for as the patient of the second.

It is as impossible in a book to teach a person in charge of sick how to *manage*, as it is to teach her how to nurse. Circumstances must vary with each different case. But it *is* possible to press upon her to think for herself: Now what does happen during my absence? I am obliged to be away on Tuesday. But fresh air, or punctuality is not less important to my patient on Tuesday than it was on Monday. Or: At 10 P. M. I am never with my patient; but quiet is of no less consequence to him at 10 than it was at 5 minutes to 10.

Curious as it may seem, this very obvious consideration occurs comparatively to few, or, if it does occur, it is only to cause the devoted friend or nurse to be absent fewer hours or fewer minutes from her patient—not to arrange so as that no minute and no hour shall be for her patient without the essentials of her nursing.

A very few instances will be sufficient, not as precepts, but as illustrations.

A strange washerwoman, coming late at night for the "things," will burst in by mistake to the patient's

Courtesy American Red Cross

FLORENCE NIGHTINGALE

sick room, after he has fallen into his first dose, giving him a shock, the effects of which are irremediable, though he himself laughs at the cause, and probably never even mentions it. The nurse who is, and is quite right to be, at her supper, has not provided that the washerwoman shall not lose her way and go into the wrong room.

The patient's room may always have the window open. But the passage outside the patient's room, though provided with several large windows, may never have one open. Because it is not understood that the charge of the sick room extends to the charge of the passage. And thus, as often happens, the nurse makes it her business to turn the patient's room into a ventilating shaft for the foul air of the whole house.

An uninhabited room, a newly-painted room, an uncleaned closet or cupboard, may often become the reservoir of foul air for the whole house, because the person in charge never thinks of arranging that these places shall be always aired, always cleaned; she merely opens the window herself "when she goes in."

An agitating letter or message may be delivered, or an important letter or message *not* delivered; a visitor whom it was of consequence to see may be refused, or one whom it was of still more consequence to *not* see may be admitted—because the person in charge has never asked herself this question, What is done when I am not there?*

At all events, one may safely say, a nurse cannot be with the patient, open the door, eat her meals, take a message, all at one and the same time. Nevertheless the person in charge never seems to look the impossibility in the face.

Add to this that the *attempting* this impossibility does more to increase the poor patient's hurry and nervousness than anything else.

It is never thought that the patient remembers these things if you do not. He has not only to think whether the visit or letter may arrive, but whether you will be in the way at the particular day and hour when it may arrive. So that your *partial* measures for "being in the way" yourself, only increase the necessity for his thought. Whereas, if you could but arrange that the thing should always be done whether you are there or not, he need never think at all about it.

For the above reasons, whatever a patient *can* do for himself, it is better, *i. e.*, less anxiety, for him to do for himself, unless the person in charge has the spirit of management.

It is evidently much less exertion for a patient to answer a letter for himself by return of post, than to have four conversations, wait five days, have six anxieties before it is off his mind, before the person who has to answer it has done so.

Apprehension, uncertainty, waiting, expectation, fear of surprise, do a patient more harm than any exertion. Remember, he is face to face with his enemy all the time, internally wrestling with him, having long imaginary conversations with him. You are thinking of something else. "Rid him of his adversary quickly," is a first rule with the sick.

For the same reasons, always tell a patient and tell him beforehand when you are going out (*Turn to next page*)

*Why should you let your patient ever be surprised, except by thieves? I do not know. In England, people do not come down the chimney, or through the window, unless they are thieves. They come in by the door, and somebody must open the door to them. The "somebody" charged with opening the door is one of two, three, or at most four persons. Why cannot these, at most, four persons be put in charge as to what is to be done when there is a ring at the door-bell?

The sentry at a post is changed much oftener than any servant at a private house or institution can possibly be. But what should we think of such an excuse as this: that the enemy had entered such a post because A and not B had been on guard? Yet I have constantly heard such an excuse made in the private house or institution, and accepted: viz., that such a person had been "let in" or *not* "let in," and such a parcel had been wrongly delivered or lost because A and not B had opened the door!

Florence Nightingale—*Continued*

and when you will be back, whether it is for a day, an hour, or ten minutes. You fancy perhaps that it is better for him if he does not find out your going at all, better for him if you do not make yourself "of too much importance" to him; or else you cannot bear to give him the pain or the anxiety of the temporary separation.

No such thing. You *ought* to go, we will suppose. Health or duty requires it. Then say so to the patient openly. If you go without his knowing it, and he finds it out, he never will feel secure again that the things which depend upon you will be done when you are away, and in nine cases out of ten he will be right. If you go out without telling him when you will be back, he can take no measures nor precautions as to the things which concern you both, or which you do for him.

The Cause of Accidents

If you look into the reports of trials or accidents, and especially of suicides, or into the medical history of fatal cases, it is almost incredible how often the whole thing turns upon something which has happened because "he," or still oftener "she," "was not there." But it is still more incredible how often, how almost always this is accepted as a sufficient reason, a justification; why, the very fact of the thing having happened is the proof of its not being a justification. The person in charge was quite right not to be "*there*," he was called away for quite sufficient reason, or he was away for a daily recurring and unavoidable cause; yet no provision was made to supply his absence. The fault was not in his "being away," but in there being no management to supplement his "being away." When the sun is under a total eclipse or during his nightly absence, we light candles. But it would seem as if it did not occur to us that we must also supplement the person in charge of sick or of children, whether under an occasional eclipse or during a regular absence.

In institutions where many lives would be lost and the effect of such want of management would be terrible and patent, there is less of it than in the private house.

But in both, let whoever is in charge keep this simple question in her heart (*not*, how can I always do this right thing myself, but) how can I provide for this right thing to be always done?

Then, when anything wrong has actually happened in consequence of her absence, which absence we will suppose to have been quite right, let her question still be (*not*, how can I provide against any more of such absences? which is neither possible nor desirable, but) how can I provide against anything wrong arising out of my absence?

How few men, or even women, understand, either in great or in little things, what it is the being "in charge"—I mean, know how to carry out a "charge." From the most colossal calamities down to the most trifling accidents results are often traced (or rather *not* traced) to such want of some one "in charge" or of his knowing how to be "in charge." A short time ago the bursting of a funnel-casing on board the finest and strongest ship that ever was built, on her trial trip, destroyed several lives and put several hundreds in jeopardy —not from any undetected flaw in her new and untried works—but from a tap being closed which ought not to have been closed—from what every-child knows would make its mother's tea-kettle burst. And this simply because no one seemed to know what it is to be "in charge," or *who* was in charge. Nay, more, the jury at the inquest actually altogether ignored the same, and apparently considered the tap "in charge," for they gave as a verdict "accidental death."

This is the meaning of the word, on a large scale. On a much smaller scale, it happened, a short time ago, that an insane person burned herself slowly and intentionally to death, while in her doctor's charge and almost in her nurse's presence. Yet neither was considered "at all to blame." The very fact of the accident happening proves its own case. There is nothing more to be said. Either they did not know their business or they did not know how to perform it.

To be "in charge" is certainly not only to carry out the proper measures yourself but to see that every one else does so too; to see that no one either wilfully or ignorantly thwarts or prevents such measures. It is neither to do everything yourself nor to appoint a number of people to each duty, but to ensure that each does that duty to which he is appointed. This is the meaning which must be attached to the word by (above all) those "in charge" of sick, whether of numbers or of individuals (and, indeed, I think it is with individual sick that it is least understood. One sick person is often waited on by four with less precision, and is really less cared for than ten who are waited on by one; or at least than 40 who are waited on by 4; and all for want of this one person "in charge.")

It is often said that there are few good servants now; I say there are few good mistresses now. As the jury seems to have thought the tap was in charge of the ship's safety, so mistresses now seem to think the house is in charge of itself. They neither know how to give orders, nor how to teach their servants to obey orders—*i., e.*, to obey intelligently, which is the real meaning of all discipline.

Again, people who are in charge often seem to have a pride in feeling that they will be "missed," that no one can understand or carry on their arrangements, their system, books, accounts, etc., but themselves. It seems to me that the pride is rather in carrying on a system, in keeping stores, closets, books, accounts, etc., so that anybody can understand and carry them on—so that, in case of absence or illness, one can deliver everything up to others and know that all will go on as usual, and that one shall never be missed.

Florence Nightingale was born May 15, 1820, in Florence, Italy (and named for her birthplace), and died in London, August 13, 1910. The daughter of an English family of social position, she utilized the social season following her presentation at Court for studying the hospitals and charitable institutions of London. A tour of Germany and France afterward enabled her to learn the methods of the more advanced hospitals of those countries. Upon returning to England, she made use of her training and executive talents in reorganizing a women's hospital in London. When she was 34 she was given the opportunity she sought to establish an efficient nursing service on the battlefields of the Crimean War. It is for the work of those two years in the Crimea that she was so widely extolled at the time, but the whole of her long life was filled with activities in every field of nursing. A reward of 50,000 pounds sterling given her by the English people enabled her to build a nurses' training home in connection with St. Thomas' and King's College Hospitals. Her advice was sought in the American Civil War and the Franco-Prussian War. At the age of 72 she organized a health campaign in rural England, sending out teacher-nurses to instruct the villagers in cleanliness and hygiene. At 87 she was decorated with the Order of Merit by King Edward VII.

FIRST GLANCES AT NEW BOOKS

A Source Book in Astronomy—Harlow Shapley and Helen E. Howarth—*McGraw-Hill* ($4). Too often the modern scientist is apt to forget or ignore the work of the pioneers in his field, even though it is on their foundation that his own work rests. In many cases the rarity or unfamiliar language of the original work is responsible for this, and so the American Philosophical Association, the other scientific societies that aided the project, and the publishers deserve the highest praise for the series of "Source Books in the History of the Sciences" that is inaugurated with this volume. Dr. Shapley and Miss Howarth have made a splendid selection of more than sixty quotations from works that are of importance in the history of astronomy. Most appropriately, the first is from Copernicus' "De Revolutionibus", telling of the motion of the earth around the sun. Tycho Brahe, Kepler, Galileo, Bayer, Huyghens, Horrox, Cassini, Newton, and others are here, down to the recent past with such names as Keeler, E. C. Pickering, Chandler, Lowell and Lockyer. Truly, it is a book that should find a place in any scientific library with the slightest pretense of completeness, and the forthcoming volumes in the series will be eagerly awaited.

Astronomy
Science News-Letter, January 19, 1929

Elementary Mechanics—Joseph B. Reynolds—*Prentice-Hall* ($2.50). This text-book of mechanics is intended for a beginning course in mechanics in technical schools, and does not require the use of mathematics higher than algebra, plane trigonometry and solid geometry.

Mechanics
Science News-Letter, January 19, 1929

Elements of Geophysics—Richard Ambronn, translated by Margaret C. Cobb—*McGraw-Hill* ($5). Since we live on the earth, the study of its physical behavior is especially important, but the science of geophysics has even more immediate practical value, for by the use of magnetism, earthquake waves, radio, and other geophysical methods, the prospector is often enabled to locate hidden ore deposits as accurately as ever claimed by any "douser" with his divining rod. This book is a complete summary of these methods.

Geophysics
Science News-Letter, January 19, 1929

John Wesley Among the Scientists—Frank W. Collier—*Abingdon* ($2.00). In his "Wesley Among the Scientists," Professor Collier has done a service to both religion and science, since he has done a service to historic truth and personal justice. His citations from the little known but extensive writings of Wesley in scientific fields prove that the founder of Methodism was well abreast of the science of his day. He showed greater interest in the study of science in its various branches than is common among the preachers of our time, and he showed greater appreciation of its cultural and religious value than is common among scientists. In both respects, Wesley sets an example that should be more widely followed.

General Science
Science News-Letter, January 19, 1929

The Discoverer—André de Hevesy, translated by Robert Coates—*Macaulay* ($3). A new biography of Christopher Columbus, written with reference to contemporary documents, where they were available, bringing out the true humanity of an almost mythical figure.

Biography
Science News-Letter, January 19, 1929

Hippocrates—Eng. transl. by E. T. Withington—*Putnam's* ($2.50). This is the third volume which contains the surgical discussions. The book gives the original Greek text on one page and Dr. Withington's English translation on the opposite page. It will appeal to students of medical history.

Medicine
Science News-Letter, January 19, 1929

Recent Advances in Anatomy—H. Woollard—*Blakiston's* ($3.50). This book presents "the problems in which anatomists are engaged." It is also limited to researches which depend on the study of living material. This is a volume for the anatomist, physician and medical student.

Medicine
Science News-Letter, January 19, 1929

The Harvey Lectures, 1926-1927—*Williams and Wilkins* ($4). The book is a collection of seven lectures on advances in medicine, given by international authorities under the auspices of the Harvey Society of New York. The subjects and their presentation are too technical for the general reader. The problems discussed are from the fields of physiology, bacteriology, public health and chemistry.

Medicine
Science News-Letter, January 19, 1929

Inorganic Chemical Technology—W. L. Badgers and E. M. Baker—*McGraw-Hill* ($2.50). A concise work on the technology of the heavy chemical industries, written chiefly from the standpoint of the engineer rather than the industrial chemist. Intended primarily as a text-book, it deals with American methods and practice, and includes much material not available in any hand-books. On that account, it will be of interest to the practicing chemical engineer as well.

Chemistry
Science News-Letter, January 19, 1929

Colloid Chemistry, Theoretical and Applied. Vol. II. Biology and Medicine—Collected and edited by Jerome Alexander — *Chemical Catalog Co.*—($15.50). Fifty-seven chapters cover all the applications of colloid chemistry to biology and medicine, including two on artefacts, four on proteins, five or inorganic ferments and enzymes, six on protoplasm and cell structure, four on microorganisms, one on fertilization, two on plants, and the rest on medical topics, with special papers on several diseases and on pharmacology. The papers show the close interrelation of the various branches of biological science and indicate that colloid phenomena, while not the sole factors in life, nevertheless enter to a greater or less extent into every one of its manifestations.

Chemistry
Science News-Letter, January 19, 1929

An Introduction to Qualitative Chemical Analysis and the Related Chemical Principles—D. P. Smith and H. K. Miller—*McGraw-Hill* ($2.25). A text-book of qualitative analysis that aims also to introduce the student to the more important principles and current theories which the analytical reactions are supposed to illustrate and to give the beginner that familiarity with inorganic substances and their behavior that is necessary for further progress in the science.

Chemistry
Science News-Letter, January 19, 1929

Who's Who in the Chemical and Drug Industries — William Haynes—*Haynes* ($6). A very useful biographical index, the usefulness of which is enhanced by a geographical index, in which all the names are listed under the places.

Chemistry
Science News-Letter, January 19, 1929

First Glances at New Books—*Continued*

THE PLATYPUS—Harry Burrell—*Angus and Robertson, Sydney* (25s). This paradoxical monotreme of the Antipodes has long been the stock marvel of naturalists and the delight of the makers of frivolous verses. But to date a really comprehensive account of its anatomy, physiology and life history has been lacking. Zoologists the world over will therefore be grateful to the Australian author, who has added to a succinct review of previous literature an account of extensive original studies of his own, illustrated with quantities of really remarkable photographs.

Zoology
Science News-Letter, January 19, 1929

ON THE BARRIER REEF—S. Elliott Napier—*Angus and Robertson, Sydney* (10s 6d). One of the things which Australia holds in common with the United States, especially California, is a great dower of natural superlatives. Both are lands that frequently end in *-est*. In the Great Barrier Reef our cousins "down under" have the greatest outdoor aquarium and marine aviary in the world, which, unfortunately for the world, is little visited. The author, who signs himself a "no-ologist", places us in his debt for a breezy, readable, informative account of the birds, beasts and fishes of this fascinating region.

Natural History
Science News-Letter, January 19, 1929

NATURALIST'S GUIDE TO THE AMERICAS—Edited by V. E. Shelford—*Williams and Wilkins* ($10). No botanist or zoologist stays at home all the time nowadays. He travels, even if only vicariously, and the materials he uses in his laboratory travel to him. The Naturalist's Guide is of use in giving him an idea of regions which he will visit, or in supplying an ecological background for specimens which he receives. The descriptions of the hundreds of regions treated are all necessarily brief; but the fact that they are all in one book and all firsthand is what gives this work its unique character.

Natural History
Science News-Letter, January 19, 1929

A DISTRIBUTIONAL SUMMATION OF THE ORNITHOLOGY OF LOWER CALIFORNIA—Joseph Grinnell—*University of California Press* ($3.15). An ecological systematic study of the resident and migratory birds of an important but as yet relatively little-known region.

Ornithology
Science News-Letter, January 19, 1929

FLOWERS OF COAST AND SIERRA—Edith S. Clements—*Wilson* ($3). There is no key nor any pretence at technical treatment in this book—just a succession of very readable sections on the wild flowers of the Pacific Coast, generously illustrated with 32 color plates in the style which Mrs. Clements has made familiar.

Botany
Science News-Letter, January 19, 1929

NEW ESSENTIALS OF BIOLOGY—G. W. Hunter—*Amer. Book Co.* ($1.68). A new printing of a successful elementary text by a well-known author.

Biology
Science News-Letter, January 19, 1929

REALITIES OF BIRD LIFE—Edmund Selous—*Constable* (14s). The field notes of an eminent naturalist, who watched keenly, recorded faithfully, and appreciated as one who is himself an integral part of the natural world.

Ornithology
Science News-Letter, January 19, 1929

THE FUR TRADE OF CANADA—H. A. Innis—*Oxford Press, Canadian Branch* ($2). A thorough-going study of the fur trade of one of the principal fur-producing countries of the world, going not only into the natural history but especially into the economics of the fur business. This book is indispensable to every one who has to do with fur or fur-bearing animals.

Mammalogy—Economics
Science News-Letter, January 19, 1929

MAN-SIZED MEALS FROM THE KITCHENETTE—Margaret Pratt Allen and Ida Oram Hutton—*Macy-Masius* ($1.60). This book, claiming to be the only cook book of its kind, is designed for the young housekeeper in a kitchenette apartment. It is practical and should be decidedly helpful. Omission of directions for washing or scraping or otherwise cleaning vegetables is surprising in a book containing so many other extremely elementary and obvious directions.

Home Economics
Science News-Letter, January 19, 1929

THE BUILDERS OF AMERICA—Ellsworth Huntington and Leon F. Whitney—*Morrow* ($3.50). A student of heredity and a student of environment consider the future of the country. The effect on political, social and economic life and progress of the country as it is influenced by the differing birth rates of various types and classes is discussed.

Eugenics—Economics—Sociology
Science News-Letter, January 19, 1929

FOUNDERS OF THE MIDDLE AGES—E. K. Rand—*Harvard University Press* ($4). Although designed to illuminate primarily the evolution of philosophy and general culture between the Fathers and the Schoolmen, this book will be of much interest to the student for its incidental bearing on the development of science during this hitherto ill-lighted period. The book is written in an easy and friendly style that at once conjures away the feeling of heaviness usually associated with treatises on mediaeval culture.

History
Science News-Letter, January 19, 1929

UNDERSTANDING SPAIN — Clayton Sedgwick Cooper — *Stokes* ($2.50). To understand a country one must study her people. The author of this book explains the process by which Spain is becoming modernized and describes the underlying features of Spanish character which have retarded the country's progress along the paths of her European neighbors. The book should be helpful to the traveler and to the business man as well.

Ethnology—Economics
Science News-Letter, January 19, 1929

MANUAL OF FURNITURE ARTS AND CRAFTS—A. P. Johnson and Marta K. Sironen—*A. P. Johnson Co.* ($5.50). This manual is crammed full of information useful to the homemaker, the interior decorator and the furniture craftsman. The authors do not claim for it the completeness of an encyclopedia, but they give a comprehensive exposition of the history of furniture, technical descriptions of periods and styles, furniture woods, upholstering, transportation, a biography, bibliographies and glossary. The text is well and profusely illustrated. Unfortunately the compact size which makes the book a handy reference manual made necessary the use of such small type that the book is not suitable for protracted reading. This detracts from the appeal which it would otherwise make to the amateur.

Technology
Science News-Letter, January 19, 1929

IMPRESSIONS OF GREAT NATURALISTS—Henry Fairfield Osborn—*Scribner's* ($2.50). A group of biographical sketches by one who has himself built a great reputation as a naturalist.

Biography
Science News-Letter, January 19, 1929

More Digging Needed

Anthropology

Following are further reports on papers in anthropology presented at the New York meeting of the American Association for the Advancement of Science.

A great need for further excavation at some of the famous sites where important discoveries of ancient man have been made was urged by Dr. Ales Hrdlicka, of the Smithsonian Institution.

"Scientists spend much time examining a few rare fossilized fragments of skulls and other bones and argue endlessly just how long man lived on earth and what sort of creature he was at first. Meanwhile the sites where the isolated specimens came from and which at any moment might yield more bones, that would settle the uncertainties and clear up deadlock arguments, are neglected. Men will argue and even quarrel violently, but no one undertakes the slow, uncertain, further labor," Dr. Hrdlicka pointed out.

For nearly twenty-years, he said, not a trace of work has been done at the stream bed in Java which yielded the unique bones of the Pithecanthropus erectus, the oldest creature resembling man that has ever been discovered. This creature with a thigh bone like that of a man and a skull cap like an ape is estimated to have lived 500,000 years ago. Additional evidence is badly needed, Dr. Hrdlicka pointed out, to prove once and for all that the thigh bone and skull really belong to the same creature, and whether he was ape or human. But there is not even a supervision of the banks of the stream to salvage any specimens that might be washed out from time to time.

Piltdown Neglected

Less than half a day's journey from London, lies the site at Piltdown, where other important and much discussed relics were found. They consist of fragments of two skulls and a part of a lower jaw, and the being they are believed to represent has been named the Dawn Man, or "Eoanthropus". He is held by some scientists to be almost as old and important as the Javanese individual. One scientist after another visits this accessible site, Dr. Hrdlicka said, but with the exception of one venerable retired British scientist, Prof. Smith Woodward, no one in 15 years has done any work there to find more specimens. Yet, this is one of the most unsettled points of man's prehistory, because the fragments of the skull seem to belong to a being with a head form and a brain far in advance of his time, while the lower jaw and the canine tooth are almost those of an ape.

In Germany, near Tübingen, at least fourteen fossil primate teeth were discovered back in the last century, Dr. Hrdlicka continued. These teeth were of the Tertiary geological period, and belong to anthropoid apes, but so near to human are some of them that the ape must have been close to a primitive man. But since that discovery there is not a report of any further attempt to find out more about these man-like ape creatures.

50,000-Year-Old Americans?

The first human beings to step on American soil must have come either earlier than 50,000 years ago or else as late as 7,000 years ago. This is geology's contribution toward solving the vexatious problem of when this continent was first inhabited. Dr. Ernest Antevs of the the American Geographical Society pointed out that the last great ice sheet slowly spread down over Canada, also freezing part of Alaska, and then slowly retreated again, blockading the northwest coast for thousands of years. The blockade of Behring Straits ended about 7,000 years ago. Since this region is generally accepted to be the route of the first American immigrants, who were Asiatics, immigration must have been impossible until that time.

Early American Emigrants

Long before the time of Columbus the New World sent human emigrants to the Old World, although America originally received its supply of human stock from the Eurasia continent.

This new idea that America was populated from Asia and at a much later date sent some of its peoples back across Behring Strait to mingle with the tribes of Siberia was presented by Dr. Franz Boas of Columbia University.

Evidences contained in the language, customs and remains of the Eskimos, Asiatic peoples, Siberian tribes and American Indians caused Dr. Boas to come to this tentative conclusion.

NATURE RAMBLINGS

By Frank Thone

Natural History

Gray Wolf

Coyotes are still fairly common on the prairies and plains of the West, and even high up into the plateau country. But their cousins, the great gray wolves that once ranged timber and open from the Atlantic to the Pacific, are now almost wiped out. They were such terrible killers, often slaughtering far more meat than any animal could eat, that it paid ranchers' associations and government officials to hire hunters and trappers to kill them off. There are still sections where gray wolves are numerous enough to constitute a major problem to the stock-raiser; but when we recall that wolves were once greatly feared in such states as Iowa and Virginia, we will realize how much the wolf problem has diminished over the country as a whole.

It is not likely that we shall ever live in a wolfless world. The gray wolf is a creature of the northern forests and wastes, where pursuing man seldom goes and where he has so far not thought of conducting major economic enterprises. So on the tundras and among the mountains of the Yukon, and over into the great stretches of Siberia and northern Russia the wolves will range and howl at night for many generations to come.

There is less objection to wolves in the wilderness where man has not yet intruded. They live by cruelty and murder, it is true, but a certain amount of killing is "natural" in a state of nature, maintaining a debit balance against the bulging credits of prolific birth. But where man appears he imperiously takes charge. Only he and the creatures that have meekly submitted to his will are permitted to survive when he clears the wilderness. And the wolf, whose motto, like that of proud Lucifer, has always been "I will not serve!" is then marked for death.